



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,793	06/01/2001	Yuji Kubo	50212-246	8377
20277	7590	11/18/2004	EXAMINER	
MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			CURS, NATHAN M	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/870,793

Applicant(s)

KUBO ET AL.

Examiner

Nathan Curs

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishakawa et al. (US Patent No. 5909297) in view of Ngo et al. ("Optical dispersion eigencompensators for high-speed long-haul IM/DD lightwave systems: computer simulation"; Ngo et al.; Lightwave Technology, Journal of, Vol: 14, Issue 10, Oct 1996; Pages 2097-2107).

Regarding claim 1, Ishakawa et al. disclose an optical transmission system comprising: an optical fiber transmission line disposed between a transmitter for transmitting a signal of a predetermined wavelength and a receiver for receiving the signal, through which the signal propagates from the transmitter toward the receiver (fig. 29-35 and col. 20, lines 34-63); a dispersion compensating system for compensating for both of chromatic dispersion and dispersion slope in said optical fiber transmission line (fig. 35 and col. 20, lines 61-63), where chromatic dispersion is the amount of dispersion at a wavelength as defined by the inherent dispersion slope of an optical fiber transmission line; a measuring system for monitoring variation in temperature of said optical fiber transmission line or variation of chromatic dispersion in said optical fiber transmission line (col. 20, lines 1-33); and a control system for controlling a dispersion compensation amount of said dispersion compensator, based on the result of measurement by said measuring system (col. 20, lines 44-63). Ishakawa et al. disclose that the dispersion compensator as a mach zehnder PLC dispersion compensator (col. 16, lines

Art Unit: 2633

1-12), but do not disclose that the fiber transmission line is comprised of a single-mode optical fiber or a non-zero dispersion-shifted optical fiber. Ngo et al. disclose a tunable mach-zehnder-based PLC dispersion compensator for use over SMF fiber (fig. 3 and page 2101, section III, col. 1, line 1 to col. 2, line 2). It would have been obvious to one of ordinary skill in the art at the time of the invention that SMF fiber could be used in the system of Ishakawa et al., since the dispersion compensation means suggested by Ishakawa et al. can be used for SMF fiber, as taught by Ngo et al. Further, it is well known in the art that SMF fiber allows transmission of high bit rate signals over long distances, and that SMF is already extensively installed in North America.

Regarding claim 2, Ishakawa et al. disclose an optical transmission system according to claim 1, wherein said measuring system includes a temperature sensor for detecting the temperature of said optical fiber transmission line (col. 20, lines 11-26).

Regarding claim 3, Ishakawa et al. disclose an optical transmission system according to claim 1, wherein said measuring system includes a dummy fiber transmission line disposed along said optical fiber transmission line, a light source for emitting monitor light of a predetermined wavelength into the dummy fiber transmission line, and a photodetector for receiving the monitor light having propagated through the dummy fiber transmission line (col. 20, lines 11-26), and wherein said control system calculates a variation amount of chromatic dispersion in said optical fiber transmission line, based on the result of detection of light quantity by the photodetector (col. 20, lines 27-33).

Regarding claim 4, Ishakawa et al. disclose an optical transmission system according to claim 2, wherein said temperature sensor includes an optical fiber temperature sensor disposed along said optical fiber transmission line (col. 20, lines 11-26).

Art Unit: 2633

Regarding claim 5, Ishakawa et al. disclose an optical transmission system according to claim 1, wherein said dispersion compensating system shifts the wavelength of the signal from said transmitter to the longer wavelength side or to the shorter wavelength side, thereby compensating for the variation of chromatic dispersion due to variation in temperature of said optical fiber transmission line (col. 17, line 10-62 and col. 20, lines 11-30).

Regarding claim 6, Ishakawa et al. disclose an optical transmission system according to claim 1, wherein said dispersion compensating system includes a dispersion compensator disposed on a signal light path from said transmitter to said receiver (col. 20, lines 44-63), and wherein said control system controls the dispersion compensation amount of said dispersion compensator according to a variation amount of chromatic dispersion in said optical fiber transmission line (col. 20, lines 27-33).

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishakawa et al. (US Patent No. 5909297) in view of Ngo et al. ("Optical dispersion eigencompensators for high-speed long-haul IM/DD lightwave systems: computer simulation"; Ngo et al.; Lightwave Technology, Journal of, Vol: 14, Issue 10, Oct 1996; Pages 2097-2107) as applied to claims 1-6 above, and further in view of Danziger et al. (US Patent Application Publication No. 2002/0006257).

Regarding claim 7, Ishakawa et al. disclose an optical transmission system according to claim 6, but do not disclose that said dispersion compensator includes a dispersion compensating optical fiber. Danziger et al. disclose a controllable dispersion compensator including dispersion compensating optical fiber (abstract and paragraphs 0010-0015). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the DCF-

Art Unit: 2633

based variable dispersion compensator of Danziger et al., in the system of Ishakawa et al., in order to control the amount of dispersion compensation in the system.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishakawa et al. (US Patent No. 5909297) in view of Ngo et al. ("Optical dispersion eigencompensators for high-speed long-haul IM/DD lightwave systems: computer simulation"; Ngo et al.; Lightwave Technology, Journal of, Vol: 14, Issue 10, Oct 1996; Pages 2097-2107) as applied to claims 1-6 above, and further in view of Eggleton et al. "Electrically tunable power efficient dispersion compensating fiber Bragg grating"; Eggleton et al., Photonics Technology Letters, IEEE, Vol: 11, Issue: 7, July 1999, Pages: 854-856).

Regarding claim 8, Ishakawa et al. disclose an optical transmission system according to claim 6, but do not disclose that said dispersion compensator includes an optical fiber grating. Eggleton et al. disclose a tunable dispersion compensator including an optical fiber grating (abstract, and page 856, Conclusion paragraph). It would have been obvious to one of ordinary skill in the art at the time of the invention to control the amount of dispersion compensation in the system of Ishakawa et al., using the grating-based tunable dispersion compensator because of its power efficiency and small size, as taught by Eggleton et al.

### ***Response to Arguments***

5. Applicant's arguments filed 30 September 2004 have been fully considered but they are not persuasive.

The applicant argues that Ishakawa et al. do not disclose or suggest forming an optical transmission system comprising a dispersion compensation system which compensates for both of chromatic dispersion and dispersion slope. However, chromatic dispersion and dispersion

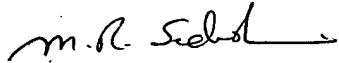
Art Unit: 2633

slope are not two different limitations. Rather, chromatic dispersion is the amount of dispersion at a wavelength as defined by the inherent dispersion slope of an optical fiber transmission line. This can be seen in the applicant's figure 3. Further, Ishakawa et al. disclose this same teaching that chromatic dispersion is the amount of dispersion at a wavelength as defined by the inherent dispersion slope of an optical fiber transmission line (col. 20, lines 5-10).

### ***Conclusion***

6. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

  
**M. R. SEDIGHIAN**  
**PRIMARY EXAMINER**